

REMARKS

Claim amendments

Applicant has amended claim 19 and cancelled claims 20-23. In addition, applicant introduces new claim 24 which depends upon claim 19.

EXAMINER'S OBJECTIONS

Objection to Drawings under 37 CFR 1.83(a)

Applicant cancels claims 20-23 without prejudice. Applicant respectfully requests the withdrawal of the objection to the drawings for allegedly failing to shown every feature of the invention specified in the claims as required by 37 CFR 1.83(a).

Rejections under 35 USC § 112

Rejection of claim 19

The Examiner has rejected claim 19 for use of the expression "normally used." In response, claim 19 has been amended to specify that the jacket of the present invention is thicker than the jacket of conventional ball projectiles of similar calibre. Support for this amendment is found at [0081]: "The jacket 11 thickness in the driving band area of the preferred embodiment, and optionally everywhere is slightly thicker than that of conventional ball projectile jackets..."

In addition, new claim 24, which depends upon amended claim 19, recites a minimum thickness for the jacket of the present invention for a 5.56 mm round. Support for the new claim is found at [0081]: , The jacket 11 thickness...e.g. 0.635 mm for a new 5.56 mm round as opposed to 0.559 mm for a standard 5.56 mm ball round."

Rejection of claim 21

The Examiner has rejected claim 21 for use of the expression “free of toxic components”. Claim 21 has been cancelled, without prejudice.

Rejections under 35 USC § 102

US 2,322,751 (Studler)

The Examiner has rejected claims 1-5, 8, 10, 11, 14, 15 and 23 under 35 USC § 102(b) as being anticipated by US 2,322,751 (Studler).

Applicant respectfully traverses the rejection. In its current form, claim 1 discloses a midsection portion which is not in continuous contact with the jacket over at least a portion of the midsection portion, wherein the midsection portion is tapered, tapering towards the front end of the projectile to provide a tapered separation between the jacket and the core along at least a portion of the length of the midsection.

Studler discloses a jacketed engravable projectile with a generally cylindrical core including two annular grooves (2 and 3). Both grooves may contribute to the reduction of the forcing resistance; however the key difference is that Studler introduces grooves into the projectile core to create two gaps between the core and the jacket, whereas claim 1 discloses a projectile that has one long, gradual taper angle of generally frusto-conical shape in the core to introduce a single gap between the core and jacket. The present invention discloses only one tapered midsection portion that is not in continuous contact with the jacket.

Groove 3 of Studler is essentially a radius of removed material situated at that portion of the projectile where the rifling lands start to engrave the projectile. This groove is concave in shape and does not have a tapered angle in its geometry.

According to Dictionary.com, “tapered” has the following definitions:

- To become gradually narrower or thinner toward one end.
- To make thinner or narrower at one end.
- Gradually decreasing in size toward a point.

The midsection portion of Studler (“a”), where groove 3 is found, is not tapered, as its profile is concave: it does not gradually become narrower or thinner toward one end, nor does it gradually decrease in size toward a point. Instead, the midsection portion (“a”) of Studler at groove 3 decreases in size at a relatively high rate, followed by a gradual decrease, followed by an increase in size. Such is the nature of a concave profile.

With regards to the midsection portion of Studler at groove 2, it is slightly tapered towards the rear of the projectile, and not towards the front. This is in direct contrast to claim 1, which requires tapering towards the front of the projectile.

In addition, the second groove (2) has a larger area than the first groove (3) and is mainly there to facilitate crimping of the jacket onto the core. This groove (2) is essentially in the form of hollow cylinder of removed material, or a step in the central core at its largest diameter/mainly cylindrical section. In order to transition from the larger diameter of the mainly cylindrical core section to the smaller diameter of the groove section, Studler shows two small chamfers at either end of the groove as represented in his Figure 1.

The chamfers are used by Studler to remove the sharp edges where the core changes diameter and mitigate the abrupt step change in the core diameter at those two surfaces. Otherwise the sharp edges could lead to cutting of the jacket at those sections during engraving.

This transition in diameters by Studler at the two ends of the larger groove (2) via the chamfers is not gradual and is therefore not in the form of a taper angle as disclosed in claim 1 of the present

application. In particular, the chamfer between regions 2 and 1 of Studler show that the groove is not tapered towards the rear, as the chamfer provides a discontinuous upward profile to the groove, in contrast to a tapering profile.

In fact, designs such as Studler (with a step-change in the core diameter at the groove of the core), where there is an abrupt change in the diameter at the grooved section, cause the projectile to be unsupported in the barrel and therefore lead to unpredictable movement and reduced accuracy. In contrast, the taper angle of the present invention eases the projectile into the barrel rifling during the engraving process.

A novel feature of the present invention is a gradual taper angle in the midsection of the core, tapering towards the front end of the projectile. This very gradual transition in diameter is what creates the optimal gap and thus allows the engraving forces to be reduced while maintaining all other ballistic performances, such as good accuracy when shooting at targets.

Applicant hereby submits that claim 1 is novel over Studler, and therefore, submits that dependent claims 2-5, 8, 10, 11, 14, 15 and 23 are also novel over Studler.

US 3,348,486 (Rapp)

The Examiner has rejected claims 1-4, 8, 10, 11, 14, 15 and 23 under 35 USC § 102(b) as being anticipated by US 3,348,486 (Rapp).

Applicant respectfully traverses the rejection. In its current form, claim 1 requires a midsection portion which is not in continuous contact with the jacket over at least a portion of the midsection portion, wherein the midsection portion is tapered, tapering towards the front end of the projectile to provide a tapered separation between the jacket and the core along at least a portion of the length of the midsection.

Rapp discloses a jacketed engravable projectile with a generally cylindrical core including two annular grooves (1 and 11). The present invention discloses only one tapered midsection portion that is not in continuous contact with the jacket.

Groove 1 of Rapp is essentially a radius of removed material situated at that portion of the projectile where the rifling lands start to engrave the projectile. This groove is concave in shape and does not have a tapered angle in its geometry.

According to Dictionary.com, “tapered” has the following definitions:

- To become gradually narrower or thinner toward one end.
- To make thinner or narrower at one end.
- Gradually decreasing in size toward a point.

The midsection portion of Rapp, where groove 1 is found, is not tapered, as its profile is concave: it does not gradually become narrower or thinner toward one end, nor does it gradually decrease in size toward a point. Instead, the midsection portion of Rapp at groove 1 decreases in size at a relatively high rate, followed by a gradual decrease, followed by an increase in size. Such is the nature of a concave profile.

With regards to the midsection portion of Rapp, groove 11 also exhibits a concave profile of the midsection. This is in direct contrast to claim 1, which requires tapering towards the front of the projectile.

The design of Rapp where there is an abrupt change in the diameter at grooved sections 1 and 11, cause the projectile to be unsupported in the barrel and therefore lead to unpredictable movement and reduced accuracy. In contrast, the taper angle of the present invention eases the projectile into the barrel rifling during the engraving process.

A novel feature of the present invention is a gradual taper angle in the midsection of the core, tapering towards the front end of the projectile. This very gradual transition in diameter is what creates the optimal gap and thus allows the engraving forces to be reduced while maintaining all other ballistic performances, such as good accuracy when shooting at targets.

Applicant hereby submits that claim 1 is novel over Rapp, and therefore, submits that dependent claims 2-4, 8, 10, 11 and 23 are also novel over Rapp.

Rejections under 35 USC § 103

Claims 6, 7, 9, 13 and 16

The Examiner has rejected claims 6, 7, 9, 13 and 16 under 35 USC § 103 (a) as being obvious over Studler in view of established case law. The Examiner asserts that Studler discloses a jacketed projectile that includes a midsection with a taper.

Applicant respectfully traverses the rejection. In its current form, claim 1 requires a midsection portion which is not in continuous contact with the jacket over at least a portion of the midsection portion, wherein the midsection portion is tapered, tapering towards the front end of the projectile to provide a tapered separation between the jacket and the core along at least a portion of the length of the midsection.

As discussed above, Studler does not disclose a tapered groove that tapers towards the front of the projectile. Instead the groove of Studler is concave in profile, and the resulting abrupt change in projectile diameter leads to a lack of support of the projectile in the barrel, and does not allow for gradual engraving.

Applicant submits that since Studler does not disclose the subject matter of claim 1, the specific dimensions/characteristics of the projectile in dependent claims 6, 7, 9, 13 and 16 are inventive over Studler.

Claims 12, 17 and 18

The Examiner has rejected claims 12, 17 and 18 under 35 USC § 103 (a). The Examiner asserts that Studler discloses a jacketed projectile that includes a midsection with a taper.

Applicant respectfully traverses the Examiner's assertion that Studler discloses a jacketed projectile as disclosed in claim 1 of the present application (please see above detailed arguments). Applicant submits that since Studler does not disclose the subject matter of claim 1, the specific materials of the projectile disclosed in dependent claims 12, 17 and 18 are inventive over Studler.

Claims 20-22

Since claims 20-22 have been cancelled, the rejection of these claims under USC § 103 (a) is moot.

Conclusion

On this basis, the Applicants request reconsideration and withdrawal of the objections and rejections.

Respectfully submitted,
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